26th Annual

Student Research Forum

March 31 & April 7, 2017

Centenary

26th Annual Student Research Forum

March 31 & April 7, 2017

Posters
Mickle Hall
(2nd floor)
2:00 – 4:30 P.M.
March 31, 2017

Humanities
Carlile Auditorium
(Mickle Hall first floor)
2:00 – 2:30 P.M.
April 7, 2017

Natural Sciences
Carlile Auditorium
(Mickle Hall first floor)
2:40 – 3:40 P.M.
April 7, 2017

Social Sciences
Carlile Auditorium
(Mickle Hall first floor)
3:50 – 4:30 P.M.
April 7, 2017

26th Annual Student Research Forum

Sponsored by

Douglas F. and Marion S. Attaway Foundation

Judges

Dr. Jessica Alexander ..... *Assistant Professor of Psychology*
Dr. David Bieler ..... *Associate Professor of Geology*
Dr. Chris Ciocchetti ..... *Associate Professor of Philosophy*
Dr. Spencer Dew ..... *Assistant Professor of Religious Studies*
Dr. Joshua Lawrence ..... *Associate Professor of Chemistry*
Dr. Rebecca Murphy ..... *Assistant Professor of Biology*
Dr. Jarret Richardson ..... *Assistant Professor of Neuroscience*
Dr. Kyle Ristig ..... *Assistant Professor of Management*
Dr. Jeffery Evans ..... *ULM Associate Professor*
Dr. Lucy Robinson ..... *LSUHSC Associate Professor, Biochemistry & Molecular Biology*

Director

Dr. Scott Chirhart
26th Annual Student Research Forum

POSTER PRESENTATIONS/ JUDGING

* Presentation and judging will take place on Friday, March 31st between 2:00 P.M.-4:30 P.M. on the second floor of Mickle Hall. In preparation of the judging, presenters should have their posters in place and ready at their assigned locations no later than Thursday evening.

2:00 P.M. Provost Jenifer Ward .....Introduction/Welcome
2:15 P.M. Laura A Perilloux.....Biology
2:30 P.M. Gabriela Giamalva and Lauren Leon.....Biology
2:45 P.M. Alexandra Britten .....Biology
3:00 P.M. Graham Maxwell.....Business

ORAL PRESENTATIONS/ JUDGING

* Presentation and judging will take place on Friday, April 7th between 2:00 P.M.-4:30 P.M. in Carlile Auditorium which is located in Mickle 114.

HUMANITIES

in Carlile Auditorium

2:00 P.M. Provost Jenifer Ward .....Introduction/Welcome
2:10 P.M. Gage Dabin..... English
2:20 P.M. Ben Green.....Art
Humanities Oral Presentations end about 2:30 P.M.

Break: 2:30 P.M. – 2:40 P.M.

NATURAL SCIENCES

in Carlile Auditorium

2:40 P.M. Brianna Jackson ..... Chemistry
2:50 P.M. Tamara Johnson ..... Chemistry
3:00 P.M. Ian Naron ..... Biology
3:10 P.M. Jeffrey Scott and Halen Sumner ..... Biology
3:20 P.M. Melissa Traver ..... Biology
3:30 P.M. Nakoma Walker ..... Biology

* Natural Sciences Oral Presentations end about 3:40 P.M.*

Break: 3:40 P.M. – 3:50 P.M.

SOCIAL SCIENCES

in Carlile Auditorium

3:50 P.M. Preston LeJeune, Jacob Mosher, Parker Bear, and Annie Cohen ..... Business
4:00 P.M. Jessica Innes, Cheredith Rhone, Matthieu St. Romain, and Loren Lepore ..... Business
4:10 P.M. Elizabeth Guerrant ..... Sociology
4:20 P.M. Elizabeth Guerrant ..... Psychology

* Social Sciences Oral Presentations end about 4:30 P.M.*

POSTER PRESENTATIONS

Toxic Effects of Cadmium on Neuronal Cells

Laura A Perilloux

Research Advisors: Drs. Chaowei Shang,
Mansoureh Barzegar, Shile Huang
Department of Biochemistry and Molecular Biology, Louisiana
State University Health Sciences Center, Shreveport, LA

Cadmium (Cd), a ubiquitous environmental heavy metal, is toxic to neuronal cells, which can induce programmed cell death (apoptosis). However, the underlying mechanism remains to be elucidated. Here we show that treatment with Cd caused cell death of human neuroblastoma cells (SH-SY5Y) in a concentration dependent manner. This was related to induction of reactive oxygen species (ROS), as pre-treatment with N-acetyl-L cysteine (NAC), an anti-oxidant and ROS scavenger, prevented Cd-induced cell death. Since activation of mTOR pathway is associated with cell death induced by oxidative stress, we next examined the effect of Cd on this pathway. As expected, treatment with Cd rapidly induced phosphorylation of S6K1 in a concentration-dependent manner. The results suggest that the cytotoxicity of Cd may be related to ROS-mediated activation of mTOR pathway.

Multi-Tasking Effects on Memory Acquisition

Gabriela Giamalva and Lauren Leon

Research Advisor: Dr. Jarret Richardson
Department of Biology
Centenary College of Louisiana

Students' ability to recall various stimuli presented to them, given in the form of auditory, visual, or textual information, was tested in the presence of various distractors. Multitasking due to the addition of these distractors was hypothesized to lead to reduction in memory recall. Additionally, it was hypothesized that participants would recall specific distractors (specifically text messages) better than the information received via the intended stimulus. Groups were given informational stimuli, either auditory alone or combined auditory and visual with visual distractors. A third group was given, in addition to audio with

visual distractors, text messages. Each participant was then given a short test on the stimuli they received. Students given visual distractors recalled significantly less of the auditory information; recall also significantly decreases with the addition of physical cell phone distractions. Interestingly, students receiving text messages had significantly greater recall for the content of the text messages than the auditory and visual information. This provides an interesting mock-up for a lecture situation where auditory and visual information is being provided and suggests that texting during said events probably leads to better memory of the text than of the important information being supplied. This gives further credence to an ongoing issue of how to handle potential phone use in class as well as how to best inform students in the current social environment.

Analysis of Olfactory Neurogenesis in GAD65-GFP Transgenic Mice

Alexandra Britten

Research Advisors: Drs. W. Devin Owens, Kathryn A. Hamilton, and Matthew P. Weidner
Department of Cellular Biology and Anatomy, Louisiana State University Health Sciences Center, Shreveport, LA

Neurons are non-regenerative cells with the exception of olfactory sensory neurons. Investigating their cell cycle would allow us to understand how they are regenerated and how they are developed in humans. The OSN cell cycle was studied in GAD65-GFP transgenic mice. EdU and TUNEL kits were run to identify whether neurons were actively dividing or undergoing apoptosis in 4, 7, and 14 day mice (post-methimazole injection). In addition, immunostaining was run in order to identify proteins of interest. Our results showed that there was fewer double and triple labelling of neurons at 14 days compared to 4 and 7 day mice. This suggests that these neurons are potentially losing undergoing apoptosis after 7 days. Future studies will look at earlier time points to better understand when in the cell cycle these neurons lose GFP+ neurons.

The Relationship between Crude Oil Prices and Rig Count

Graham Maxwell

Research Advisor: Dr. Harold Christensen
The Frost School of Business
Centenary College of Louisiana

The oil industry represents one that is highly sensitive to the market price of oil. On a weekly basis Baker Hughes Inc., releases a rig count which measures the number of active drilling rigs across the United States. Rig count represents a good indicator of the current health of exploration expenditures in the industry. Around May 2014, the price of oil started to fall significantly due to a number of factors, and at about this time, rig counts were also falling. In this study, I analyze data from the time period between May 2014 and February 2017. Because of the perceived relatedness of rig count and real price of oil, I only take into account these two variables. I calculate an appropriate lag time in which rig count reacted to the drop of price, and additionally, I look at the rise of rig count in certain basins due to the recent steady increase in the price of oil.

HUMANITIES ORAL PRESENTATIONS

Who am I? Who are you?: Understanding Imperial Britain's Historical Pattern of Ethnic Conflict

Gage Dabin

Department of English
Centenary College of Louisiana

This research investigates the novels *Waverley* by Sir Walter Scott, and *A Passage to India* by E.M Forster. Most research and criticism of the aforementioned novels looks to understand the author's viewpoint on the topics they address; I, however, use political science theories and historic information to explain the ethnic conflict issues that the authors discuss in 18th Century Scotland and 20th Century India. Both are individualized case studies that when combined establish the reasoning behind the British Empire's continued struggle with ethnic conflict issues in their colonies. Through the novels both Scott and Forster suggest that the ethnic clashes resulted from a combination of cultural identity repression and the failure for indigenous ethnic groups to work together to overpower England.

Or So the Story Goes: Discourses on the Art of Clementine Hunter

Ben Green

Research Advisor: Dr. Lisa Nicoletti
Department of Art
Centenary College of Louisiana

This presentation examines how the current collection, marketing, and analysis of Clementine Hunter's folk art reinforces ideologies of racial Otherness despite the potential to consider her as a subversive force in the art world. I attempt to re-contextualize Hunter's biography and her art in a way that question the colonial gaze rather than feed into nostalgic and racist tropes. This includes a brief discussion of "primitive art," a pejorative label, and how visual representations may exist as manifestations of power dynamics. By investigating how Hunter negotiates the boundaries of Otherness, I also attempt to show how her art reflects the fragility of cultural identity. Hunter works within the dominant modes of representation when she creates work that seemingly endorses the placement of black women in arenas of domestic servitude. Her status as a woman of color, though, inherently puts her on the outskirts of the predominantly white art world. By relying on queer theory and critical race theory, there may be ways to present an often unarticulated history that creates friction or tension with the current narratives and discourses which surround Clementine Hunter and her art.

NATURAL SCIENCE ORAL PRESENTATIONS

Developing Methods for Identifying GAD65 (GAD2) in Mouse Olfactory System

Brianna Jackson

Research Advisor: Dr. Kathryn A. Hamilton
Department of Cellular Biology and Anatomy, Louisiana State University Health Sciences Center, Shreveport, LA

Olfactory sensory neurons (OSNs) are unique in that they can be regenerated throughout life. In mice, OSNs are excited odors and their axons transmit the excitation to the main olfactory bulbs (MOB). We are studying OSN neurogenesis in GAD65-GFP mice,

in which the promoter for the enzyme GAD65 drives expression of GFP. These mice have been used to study functions of GFP+ inhibitory interneurons in the adult main olfactory bulb (OB; Hamilton et al., 2005). However, adult OE has not been examined and is not known to express GAD. Our lab found that OSNs of adult mice are GFP+, suggesting they might express GAD65 Owens, 2012). GFP+ cell bodies give rise to a dendrite extending toward the nasal cavity and an axon projecting to the MOB, resembling mature OSNs. However, immunostaining indicates the OSNs are immature and nonfunctional. Here, we isolated mRNA from GAD65-GFP and wild-type mice and synthesized cDNA for use in quantitative RT-PCR using GAD65 (GAD2) primers we designed. The methods developed will be used to determine if OE of GAD65-GFP mice express GAD65. Ultimately, this work should provide new information on mechanisms regulating olfactory neurogenesis and the potential role of GAD.

S-sulfhydration of proteins in endothelial cells

Tamara Johnson

Research Advisors: Drs. Xinggui Shen and Christopher G. Kevil
Department of Pathology, Louisiana State University Health Sciences Center, Shreveport, LA

The sulfur atom found on cysteine residues can bond with an additional sulfur atom containing a hydrogen atom. This process is called sulfhydration and can occur when compounds such as hydrogen sulfide are present in the cell. Cysteine residues found in proteins that have undergone sulfhydration play important roles in diverse biological functions. Mouse aortic endothelial cells were treated with H2S and various polysulfides. We compared the differences in protein targets in the cells modified by the added sulfides utilizing a modified biotin thiol assay (BTA). The modified cysteines produced were identified by LC-MS analysis. The results show that free H2S and polysulfides select for different subsets of proteins in the cells. The classification of the proteins in each subset using bioinformatics methods is in progress.

The Expression of Antioxidants in CMV infected Heart Cells

Ian Naron

Research Advisor: Dr. Karen Stokes
Department of Biochemistry and Molecular Biology, Louisiana State University Health Sciences Center, Shreveport, LA

Cytomegalovirus (CMV) is present in over half of adults over the age of 40. While CMV typically does not harm an individual, it can cause complications when it is combined with other ailments such as a myocardial infarction. This experiment focuses on determining the expression of antioxidants in CMV infected mice myocardial cells. One side effect of CMV is the production of radical oxygen species (ROS). Radical oxygen species are dangerous to the body. Antioxidants fight the effects of radical oxygen species. CMV upregulates antioxidant production in cells to keep cells functioning properly. This experiment will measure expression of two antioxidant enzymes in myocardial cells, Superoxide dismutase (SOD) and Glutathione peroxidase 1 (GPX-1), using western blots. The mice used for this experiment varied in how long they had CMV. Some mice had just contracted it while others had CMV for an extended period of time. The results of the experiment showed CMV upregulates antioxidant expression to a point. The antioxidant levels began to fall for mice that had contracted CMV two years ago. The virus had begun to downregulate antioxidant levels. The downregulation of antioxidants could lead to cell damage due to oxidative stress.

Catatonia/Avolition in *C. Elegans*

Jeffrey Scott and Halen Sumner

Research Advisor: Dr. Donald S. Dwyer
Department of Psychiatry and Department of Pharmacology, Toxicology, and Neuroscience, Louisiana State University Health Sciences Center, Shreveport, LA

Animal behavior is motivational; whether it is locating food, finding a mate, or avoiding harm, all organisms have the same driving force for their behavior. Many of these behaviors are observed in humans with psychiatric illnesses, specifically major depression disorder and schizophrenia. A common behavior associated with these illnesses is avolition, or a severe lack

of motivation and interest to perform necessary behaviors to accomplish acts such as daily living, goals, and desires. Since motivation is shared across species, we sought to use the model organism *C. elegans* to learn more about genetic and biochemical factors that fundamentally mediate motivational states. We previously discovered certain experimental conditions cause animals to remain immobile, although still responsive, despite exposure to food deprivation, which normally drives food-seeking behaviors. These conditions included: a *daf-2* genetic mutation, DMSO (1%), and brief food deprivation. The *daf-2* mutant exhibits loss of function in the insulin receptor. We discovered these conditions only applied to *daf-2* that were in the larva 2 and 3 stages. We started the *daf-2* on a small plate with food and the drug being tested and left them on the plate for approximately ninety minutes. The *daf-2* were then transferred to a large plate with the drug being tested and no food for approximately two hours. Our goal was to see if we could overcome the state of diminished motivation (immobility) with pharmacological agents and neurotransmitters. We found that blocking serotonin receptors with 5-HT antagonists Cyproheptadine and Loxapine resulted in positive effects that almost completely restored mobility and thus, motivation. This effect was also found when antidepressant drugs, such as amoxapine, amitriptyline, and imipramine, were tested. The antidepressant drugs were inhibiting the reuptake of monoamine neurotransmitters dopamine and serotonin. Since antidepressants improve apathy and increase the ability to feel pleasure in depressed patients, it is possible that these studies may provide additional insights into the mechanism of these drugs and neurotransmitter systems that underlie motivation. The data from this model also suggests an explanation for the connection between type 2 diabetes mellitus (insulin insufficiency) and major depressive disorder.

The Role of Protein Interactions in the Control of Photoperiodic Flowering in *Sorghum bicolor*

Melissa Traver

Research Advisors: Drs. Daryl T. Morishige[2], John E. Mullet[2], Rebecca L. Murphy[1]
[1]Centenary College of Louisiana
[2]Department of Biochemistry and Biophysics, Texas A&M University, College Station, TX

In light of the world's steadily increasing food and energy demands, producing crops as efficiently as possible has become especially important. *Sorghum bicolor*, a cereal crop that already serves as a food source for millions worldwide, has more recently gained popularity as a bioenergy crop, due largely to its drought tolerance and ability to grow on marginal land. Whether sorghum is grown for food or fuel, understanding its maturation in response to day length is the key to optimizing yields. In the last decade, the genes underlying several loci that control flowering time in sorghum have been identified, including *Ma1* as PRR37 and *Ma6* as Ghd7. Moreover, an important role for Constans in sorghum has also been established during these studies. Though these proteins clearly contribute to photoperiodic regulation of flowering, the nature of each of their contributions to the overall pathway is not clear. These genes have all been shown to exhibit characteristic expression patterns in response to both light and the circadian clock, and one of these, Constans, has been shown to interact with certain Nuclear Factors (NF-Ys) in other species. Therefore, we have chosen to investigate the molecular mechanism by which these proteins influence flowering in sorghum by searching for protein interaction partners using a combination of gene expression studies to look for co-expression of potential partners, and yeast two-hybrid screens to test for interactions between these three proteins and other candidates, including Constans-like (COL) proteins and sorghum NF-Ys.

Effect of Ciclopirox Olamine on Cell Proliferation and mTOR Function in Lung Cancer A549 and A427 Cells

Nakoma Walker

Research Advisors: Drs. Chaowei Shang, and Shile Huang
Department of Biochemistry and Molecular Biology, Louisiana State University Health Sciences Center, Shreveport, LA

Discovery and development of a new drug is time-consuming, laborious, and expensive. An alternative strategy is to reposition existing drugs for new uses. Ciclopirox olamine (CPX), an off-patent antifungal drug, has recently been found to possess anticancer activity in some tumors. However, little is known about the anticancer effect of CPX on lung cancer. In this study, we found that CPX inhibited cell proliferation and reduced cell viability in two lung cell lines (A427 and A549) in a concentration-dependent manner. As the mammalian target of rapamycin (mTOR), a serine/threonine kinase, plays a central role in regulating cell proliferation and survival, we further investigated whether CPX inhibits mTOR pathway. Our Western blot analysis showed that CPX inhibited the phosphorylation of S6K1 and 4E-BP1, two well-known substrates of mTOR, suggesting inhibition of the mTOR pathway. The results indicate that CPX does have anticancer activity in lung cancer cells, which is associated with inhibition of the mTOR signaling pathway.

SOCIAL SCIENCE ORAL PRESENTATIONS

Navigating the Global Financial System; Part I: SMIF Small to Mid-Value and Large Cap Funds

Preston LeJeune, Jacob Mosher, Parker Bear, and Annie Cohen

Research Advisor: Dr. Barabara Davis
The Frost School of Business
Centenary College of Louisiana

The purpose of our research was to analyze the various funds in the Student Managed Investment Fund (SMIF), in order to calculate returns and compare them to their benchmarks. Throughout our research, we focused on small, mid, and large cap investment funds. The words 'small, mid, and large' are adjectives that describe

the size of the companies, which make up the individual mutual funds. A mutual fund is an investment fund that collects from many investors for investing in securities such as stocks, bonds, money market instruments and similar assets. An ETF, or exchange traded fund, is a security that tracks an index, a commodity, bonds, or a basket of assets like an index fund. Unlike mutual funds, an ETF trades like a common stock on a stock exchange.

Navigating the Global Financial System: Part II

Jessica Innes, Cheredith Rhone, Matthieu St. Romain, and Loren Lepore

Research Advisor: Dr. Barbara Davis
The Frost School of Business
Centenary College of Louisiana

A continuation on Centenary College's Student Managed Investment Fund looking at 2016 data on International, Alternative, and Fixed Income investments. The International sector includes emerging markets, which are developing economies, many of which are experiencing rapid growth and industrialization, as well as exchange traded funds based in other more developed countries such as those in Europe. The Alternative investments section is made up of Real Estate, U.S. Energy, U.S. Technology, and U.S. Consumer Staples. Fixed income are debt securities that promise a fixed stream of income composed of bonds or cash equivalents.

Male Perceptions of Gender and their Influences on Romantic and Sexual Relationships

Elizabeth Guerrant

Research Advisor: Dr. Michelle Wolkomir
Department of Sociology
Centenary College of Louisiana

This study examines the influence that men's perceptions of women have on their romantic and sexual relationships with women. Because gender is central to the construction and meaning of social interactions, this study investigates how gendered perceptions affect romantic and intimate relationships. To explore these perceptions, I conducted loosely structured interviews with 10 men who self-identified as heterosexual

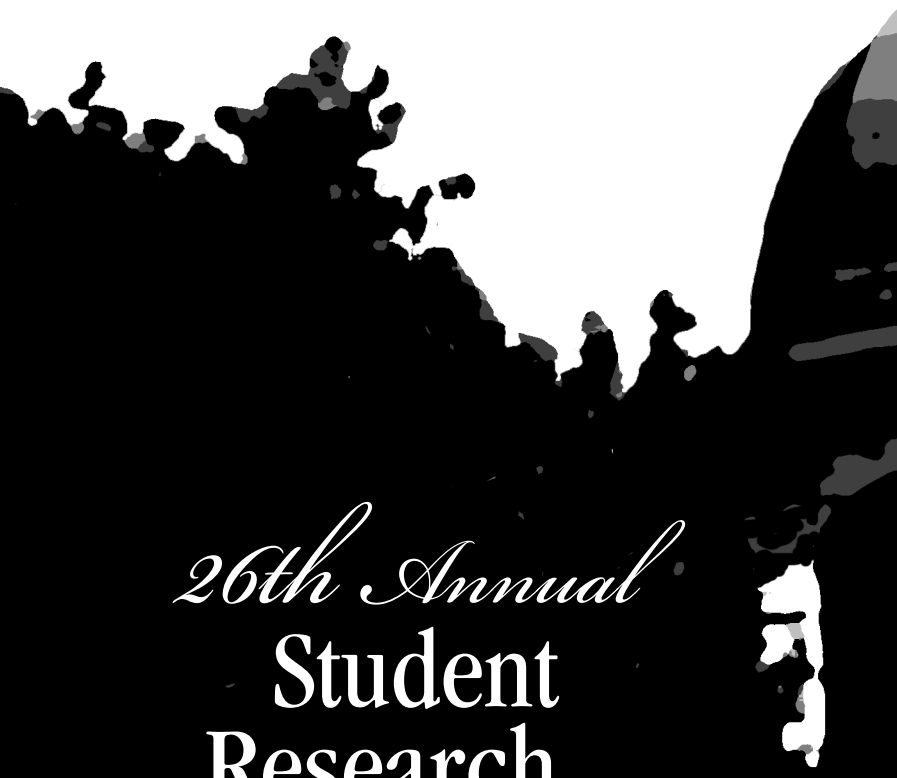
and were currently enrolled in an undergraduate college or university. Findings reveal that participants recognized the hegemonic view of women in society, although their own perceptions of women vacillated between traditional and non-traditional gender depending on their closeness to the women. Specifically, perceptions of women in casual romantic and sexual relationships align with hegemonic gender, in which interviewees view women as objects, maintain male power, and value traditionally feminine qualities. However, men's perceptions of women become more egalitarian when they are in committed romantic and sexual relationships. In these instances, men seek more balanced power dynamics, value emotional connection, and interact using a mix of traditional and non-traditional gender qualities. Understanding the relationship between the societal construction of gender and its effects on men's own perceptions of gender is an important piece in understanding how men conceptualize and experience intimate relationships. By normalizing non-traditional gender dynamics within relationships, the gender binary traditionally created and reinforced through heterosexual relationships may diminish.

Undergraduate Students' Self-Efficacy Development and Goal Orientation: Influence of Caregiver Relationship

Elizabeth Guerrant

Research Advisor: Dr. Amy Hammond
Department of Psychology
Centenary College of Louisiana

One of the most reliable predictors of academic performance is a student's self-efficacy, an individual's belief that they can successfully complete the tasks necessary to reach the desired outcome. Previous lines of research have identified several individual differences and outside influences which affect the relationship between academic success and self-efficacy. Specifically, dimensions of the caregiver relationship including attachment, relationship quality, involvement, and expectations. For the current study, a self-reported measure of student self-efficacy, motivation and goal orientation, perceived parental expectations, and parental attachment were obtained via survey to explore the effects of caregiver expectations and attachment on a student's own motivation and goal orientation.



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